REMARKS

Duplicate claim 40 has been renumbered as new claim 54, and new claims 55-59 are presented. Claims 1 - 59 are pending.

Minor changes to several of the claims have been made to address grammatical informalities, antecedent basis issues, and other minor matters, not intended to distinguish over any references.

IDS

The Examiner is thanked for noting that the third page of the originally filed PTO-SB-08 is missing from the file. Kindly find enclosed the third sheet of the PTO-SB-08 requested by the Examiner, updated to show the serial number, group art unit, and Examiner's name. As the three documents listed on this page of the PTO-SB-08 were previously submitted and are part of the PAIR electronic file, duplicate copies of these documents are not enclosed.

Should the $180.00 fee for an Information Disclosure Statement submitted after the first Office Action on the Merits but before a final Office Action be required under 37 CFR 1.17(p), kindly charge this fee to Deposit Account No. 50-0281.

Allowable claims

The Examiner is thanked for the indication that Claims 18 and 19 are directed to allowable subject matter.

Rejections under 35 U.S.C. § 103(a)

Page 2 of the Office Action set forth a rejection of independent claim 1, and dependent claims 2-9, 14-16, 23-31, and 50-53 as being obvious under 35 U.S.C. § 103(a) in view of a hypothetical combination of U.S. Patent No. 5,437,051 to Oto and U.S. Patent No. 6,345,176 to Mattison.

Applicants respectfully traverse this rejection and provide the following comments.

Claim 1 is directed to a superheterodyne receiver suitable receiving RF energy in an upper frequency band and a lower frequency band and for translating the received RF energy to an output frequency. The receiver includes at least one attenuator for attenuating the received RF energy; a first mixer arranged for mixing the RF energy in the lower frequency band with a first local oscillator signal to produce a signal at a first intermediate frequency; a second mixer arranged for mixing the RF energy in the upper frequency band with the first local oscillator signal to produce a signal at a second intermediate frequency; a switch arranged to direct the first local oscillator signal to the first mixer or to the second mixer; and a third mixer for mixing a second local oscillator signal with the signal at the first intermediate frequency or with the signal at the second intermediate frequency to produce a signal at the output frequency.

Oto discloses a tuning circuit suitable for receiving RF signals in a broad frequency band including communication signal frequencies, lower broadcast signal frequencies, and CATV frequencies. The received RF signals are split into a lower frequency signal a and a higher frequency signal b. Each of the signals is passed through an amplifier, attenuator, amplifier, filter, and mixer. (Column 3, line 64 - column 5, line 12 and Figure 3). As Oto

does not disclose any mechanism for powering-off the amplifiers, it appears that the high frequency and low frequency signals pass through the components in channels A and B, respectively, whenever signal is received by the antenna. The Oto selector 56 allows the user to select which IF signal is applied to the downstream components (IF amplifier 26, the filter 28, the amplifier 30, and the demodulator 60) (Column 4, line 61 - column 5, line 11). Thus, low frequency and the high frequency portions of the received signals are simultaneously transmitted through the respective channels A and B, with the user selecting which of the two resulting IF signals should be forwarded to the downstream components.

The Office Action acknowledges that Oto does not include the claimed feature of a switch arranged to direct a local oscillator signal to a first mixer or a second mixer. The Office Action points to Mattison as having this feature, and asserts that one of ordinary skill in the art would have been motivated to modify Oto to include a switch such as the switch 6 in Mattison for the purpose of "reducing power consumption". Applicants respectfully disagree.

Mattison describes a radio front end circuit that has a switch 6 that sends the incoming signal through low noise components 1 and 10 if the signal strength is low or the interference is low (Column 2, lines 30-36). When the signal strength is high, the low noise components are not needed, so the switch 6 disconnects the mixer 4 so the low noise amplifier 1 does not consume any power (Column 2, lines 37-40). The low noise components result in high power consumption (Column 52, lines 50-52). Thus, it appears that the IF signal received by the

antenna is amplified in the low noise amplifier 10 or the low current amplifier 11, but not both.

Applicants respectfully submit that neither Oto nor Mattison provide any motivation to make the proposed modification to the system of Oto.

As mentioned above, in Mattison, switching the low noise amplifier 10 off is done based on the signal strength or interference level of the incoming signal from the antenna. Mattison discloses nothing about any desirability of reducing power consumption or turning off amplifiers in a system that has parallel channels for high frequencies and for low frequencies with a user-selection of which signal should be forwarded for further processing, such as the system in Oto. Nor does Oto indicate that turning off any of the amplifiers would be desirable. Thus, motivation to make the suggested combination cannot be found in either Mattison or Oto.

For at least this reason, a prima facie case of obviousness has not been established.

Withdrawal of the rejection of independent claim1 is respectfully requested.

Dependent claims 2-9, 14-16, 23-29, are believed to be allowable for at least the same reason that Claim 1 is allowable. Nonetheless, a few comments are provided regarding several dependent claims in order to expedite prosecution.

Dependent Claim 15 recites the additional features that the receiver has no filter and no amplifier between the input and the first mixer, and the receiver has no filter and no amplifier between the input and the second mixer. The Office Action acknowledges that

Mattison does not disclose this feature, and asserts that it would have been obvious to eliminate the filter and amplifier of Mattison for cost savings.

Mattison includes two amplifiers (12A and 16A), one filter (54), and an attenuator (14A) between the input splitter 52 and a mixer 20A, and includes two amplifiers (12B and 16B), one filter (58), and an attenuator (14B) between the input splitter 52 and a mixer 20B. In Mattison's low frequency channel, Mattison indicates that the signal is amplified "*to a suitable level*" by amplifier 12A, attenuated by attenuator 14A to reduce noise components, and again amplified to the restore the level of the RF signal, and explains that the filter 54 removes undesired frequency components above the first prescribed frequency band. Nothing in Oto suggests that the amplifiers and filters could be removed. Mattison also includes an amplifier (1, 2) arranged before the mixers (4, 5), and states that more amplifiers can be used (col. 1, lines 60-66). Thus, the motivation to make the proposed modification of removing the amplifiers 12A, 16A, 12B, and 16B cannot be found in either Oto or Mattison.

With respect to Claims 23-27, the Office Action acknowledges that neither Oto nor Mattison disclose the intermediate and output frequencies claimed. One of the requirements of *prima facie* obviousness of a claimed invention is that all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Since all the claimed features are not taught or suggested by Oto or Mattison, a prima facie case of obviousness has not been made.

Independent claims 30 and 31 and claim 50 are believed to be allowable for at least the same reasons that Claim 1 is allowable.

Moreover, it is noted that the Office Action has not addressed the Claim 30 feature that the output frequency of the third mixer is lower than the first and the second intermediate frequencies. To the extent that the Office Action points to the Oto demodulator 60 as corresponding to the claimed third mixer, Oto does not disclose that the signal output from the demodulator 60 is lower than the frequencies of the signal exiting the mixers 20A and 20B. Nor does the Office Action address the claim 30 features of "at least one filter arranged to bandpass the signal produced by the first mixer, the first mixer folding any interfering frequencies produced by the first mixer outside the bandwidth of the filter"; and "at least one filter arranged to bandpass filter the signal produced by the second ~~first~~ mixer, the ~~first~~ second mixer folding any interfering frequencies produced by the second mixer outside the bandwidth of the filter". It is respectfully submitted that neither Oto nor Mattison disclose these claimed features.

The Office Action at page 7 sets forth a rejection of Claim 20 under 35 U.S.C. § 103(a) based on a hypothetical combination of Oto, Mattison, and U.S. Patent No. 6,029,054 (Lemley). The Office Action indicates that Lemley discloses the feature that the first intermediate frequency is greater than an upper limit of the frequency band, and the second intermediate frequency is lower than a lower limit of the upper frequency band. The Office Action asserts that one of ordinary skill in the art would have been motivated to modify the Oto system to include this feature "to narrow the variable frequency range of the LO signal, for simplifying the LO design". Applicants respectfully note that the LO signal in Oto has a range of 900 - 2100 MHz (0.9 to 2.1 GHz), while Lemley's Figure 2 shows a LO range of

9.35 to 18.2 GHz, a range that is more than 6 times greater than the LO range of Oto. As the proposed modification would *not* narrow the frequency range of Oto's LO signal, the purported motivation to make the proposed modification cannot be found in Lemley. For at least this reason, a prima facie case of obviousness has not been established for claim 20.

Independent Claim 32, and dependent claims 33-49 and 54 are believed to be allowable for at least the same reasons that Claim 20 is allowable.

The remaining dependent claims are believed to be allowable for at least the same reasons that the independent claims are allowable, and have not been addressed further at this time.

New Claims

New claims 55-59 are provided to set forth additional features for examination. No new matter has been added.

Conclusion

As all claims are believed to be in condition for allowance, an early indication of the allowability of the application is respectfully requested.

Should any questions arise regarding this Amendment or the application in general, the Examiner is cordially invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,

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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number:	10/817,416
Filing Date	April 2, 2004
First Named Inventor:	Goodman
Art Unit :	2681
Examiner Name	Nguyen
Attorney Docket No.	95,855

Sheet 3 of 3

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
		Tsui, J. B-Y., Microwave Receivers with Electronic Warfare Applications, pages 134 - 181, (1992).	
		MALMQVIST,R., GUSTAFSSON, A., DANESTIG, M., OUACHA, A., HAGELIN, S., RUDNER, S., Analysis of Tunable Narrow-band Recursive Active MMIC Filters for Future Adaptive On-Chip Radar Receivers., Microwave Conference, 2000 Asia Pacific, 3 - 6 Dec. 2000, pages 1073 - 1076.	
		MALMQVIST,R., GUSTAFSSON, A., ALFREDSSON, M., OUACHA, A., A Tunable Active MMIC Filter for On-Chip X-Band Radar Receiver Front-Ends, Microwave Symposium Digest, 2002 IEEE Mtt-S International, Volume 3, 2-7 June 2002, pages 1907 - 1910.	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature _____ Date Considered _____